



ELECTRICAL/ELECTRONIC WORKBENCHES



Background

- CNSLINST 9000.1C (Sect 9300.5)
- Builders Specs (Sect 665)
- GSO 665
- NSTM 300R4 Appendix H



Current Guidance

- NSTM 300 R5 Appendix H



General Information

- Electrical/electronic workbenches are used to work on energized electrical and electronic equipment.
- They are used individually and in workshops such as Electrical Repair, AIMD, Electronics, Avionics, and Calibration.
- The workbenches are insulated from the top working surface and below to reduce the shock hazard to maintenance personnel.



Grounding Requirements

- Metal workbenches shall be grounded to the hull and have equipment grounding leads.
- Grounding studs shall be welded to the hull.
- Ground wire can be other than green in color or designation.
 - Replacement wires must be green.



Insulation

- Electrical/Electronic workbenches are insulated from the top working surface to the deck.
- Metal structures and objects adjoining the workbench and within the reach of the technician, **may** be insulated.
- The deck in front of the workbenches shall be covered with electrical grade matting.



Insulation (cont)

- The deck in front of the workbenches shall be covered with electrical grade matting.
- The working surface insulation shall be either 3/8 inch Benelex 401 (a dark brown material) or Arboron secured to the support surface with 1/4-20 nylon screws.



Exposed Metal Surfaces

- Shall be insulated with plastic laminate in accordance with MIL-P-15037.
- The surfaces to be covered are:
 - Front surfaces of cabinet and auxiliary table.
 - Knee surfaces under auxiliary table.
 - Drawer fronts.
 - Foundations (these may be covered with electrical grade matting).



Shelf Area

- The insides of the drawers need not be covered.
- An alternative to insulating the fronts of the shelves is to install a door over the opening.
- The door shall be Benelex, Arboron or other non-conductive material.



Surrounding Deck Area

- Electrical grade sheet deck covering conforming to MIL-M-15562, Type 1, shall be installed in front of insulated workbenches.
- No seams shall be within 3 feet of electrical/electronic workbenches.



Attaching Metal Objects

- Do not defeat the purpose of the insulation by attaching **vices**, **locks**, **hasps**, metal tie downs, or other metal hardware to the metal workbench through the insulation.

DISCONNECT SWITCHES

- Power disconnect switches **shall** be provided to quickly disconnect workbench power (60Hz, 400Hz, DC).
- The disconnect switch(es) shall not be located on the workbench.
- Three types of switches exist.



TYPE 1 (Preferred)

- One switch (pushbutton station) disconnects all power (60Hz, 400Hz, DC) to all workbench EPOPs and electrical receptacles and test switchboards.
- Located just inside the access to the space.
- Located 48 to 54 inches above the deck, within a **red-painted** target.



TYPE 2 (Most Frequent)

- Individual switches disconnect 60 Hz power, 400 Hz power and DC.
- Multiple disconnect pushbuttons (switches) shall be wired so activation of any pushbutton (switch) will secure ALL power (60Hz, 400Hz DC) to ALL workbenches.



TYPE 3

- Circuit breakers in power panels disconnect power to workbench EPOPs and receptacles and test switchboards.
- Power panels (60Hz, 400Hz, DC) must be installed in the same compartment as the workbenches.
- Circuit breaker(s) inside the power panel(s) shall be **clearly marked** with a **red target** around them for easy identification.



WORKBENCHES and TEST SWITCHBOARDS

- Power for electrical/electronic workbenches and electrical test switchboards in the same compartment shall be controlled by the same power disconnect switch(es).



SIGNS AND LABELS PLATES

DANGER

**ELECTRICAL SHOCK DO NOT
TOUCH ENERGIZED CIRCUITS**

**THIS IS AN ELECTRICALLY SAFE
WORKBENCH**



SIGNS AND LABEL PLATES

DANGER

**WORKING ON ENERGIZED
ELECTRICAL
EQUIPMENT IS PROHIBITED ON
THIS WORKBENCH**

**THIS IS NOT AN
ELECTRICALLY SAFE WORKBENCH**



SIGNS AND LABEL PLATES

DANGER

**DO NOT ATTEMPT TO
ADMINISTER FIRST AID OR
COME INTO PHYSICAL CONTACT
WITH AN ELECTRIC SHOCK
VICTIM BEFORE THE POWER IS
SHUTOFF**



SIGNS AND LABEL PLATES

REMOVAL OF PERSONNEL IN CONTACT WITH ENERGIZED ELECTRICAL CIRCUITS

**DO NOT TRY TO REMOVE VICTIM WITH YOUR BARE
HANDS.**

1. DE-ENERGIZE THE CIRCUIT IF POSSIBLE.

2. IF CIRCUIT CANNOT BE DE-ENERGIZED:

- YOU MUST INSULATE YOURSELF FROM HIS
ENTIRE BODY BY USING A NON-CONDUCTOR TO
PUSH HIM FREE OF THE CONTACT.**
- IF YOU ARE IN CONTACT WITH A LIVE CIRCUIT
AND NO ONE IS NEARBY TO HELP, TRY TO BREAK
THE CONTACT BY THROWING YOUR BODY.**



Common Problems

- Type 2 switches do not disconnect all power
- Incorrect signs posted
 - “Decertified” workbench ??
- Electrical grade matting insufficient
- Metal objects installed/exposed